Chapter 1

Introduction

Archaeology creates a view of the cultural past by studying the objects people have made, and by plotting the occurrence of specific artifact types across space and through time. We know from everyday experience that members of various social groups or nations make things according to distinctive stylistic patterns. These patterns reflect shared ideas about what is efficient, or attractive, or sacred. Ideas about what constitutes proper form of course vary from group to group, and they change over time. Traditional clothing styles, for example, differ from country to country, and everywhere fashions come and go. Stylistic change is reflected in many common tools and objects of everyday use. Thus archaeology, through the comparative study of ancient artifacts from many different places, can map out the regions or culture areas once occupied by prehistoric peoples of different traditions. Changes in the artifact styles of such regions over time allow the definition of cultural periods, or phases. Functional artifacts such as projectile points, milling stones, fish hooks, and carrying baskets reflect the day-to-day activities of a people. So do cultural features like firehearths, house pits, and earth ovens. Habitation residues, such as the charred bones, shells, seeds, or roots that might be sieved from a firehearth or trash pit, give evidence of a people's diet and insight into their hunting and gathering practices. Some of these same residues, and other evidence such as buried pollen or various kinds of geological phenomena, tell of biotic and climatic conditions of past times. As the archaeological inventory of a region becomes ever more fully known through systematic survey and excavation, so do the lifeways of the people who left the specimens behind.

Time Perspective

Many techniques are available to the archaeologist for determining the sequence of cultural developments over time, and for estimating the age of cultural events. Three fundamental approaches—stratigraphic excavation, typological cross-dating, and radiocarbon dating—have been of most importance to the study of Oregon prehistory (Figure 1.1). Of these techniques, stratigraphic excavation is the most basic. It has been in use almost as long as there has been a science of archaeology. Typological cross-dating is another long-established and basic technique, still extremely important in archaeological research. Radiocarbon dating was developed during the early 1950s, and has since become the principal means for measuring the age of archaeological sites.

Stratigraphic Excavation

Stratigraphic excavation relies on the elementary fact that in a series of earth layers or strata, laid down on a given spot over a period of time, the sequential order of strata from bottom to top of a deposit shows the relative ages of any objects contained in them (Figure 1.1). Much of the legendary care that archaeologists devote to excavation is spent on precisely determining stratigraphic sequence, because recovering artifact assemblages from successive time periods is essential to the analysis of cultural change. Even without other dating techniques, this method allows an archaeologist to define cultural periods and establish cultural continuity or change over time. By itself, however, stratigraphic excavation cannot establish the actual age of archaeological finds. It can place artifact assemblages in proper time sequence relative to one another, but other techniques are needed to determine ages in years. The most important and widely used technique is radiocarbon dating.

Radiocarbon Dating

Radiocarbon dating begins from the fact that Carbon-14 (hereafter abbreviated ^{14}C), an unstable radioactive isotope of carbon, is ever

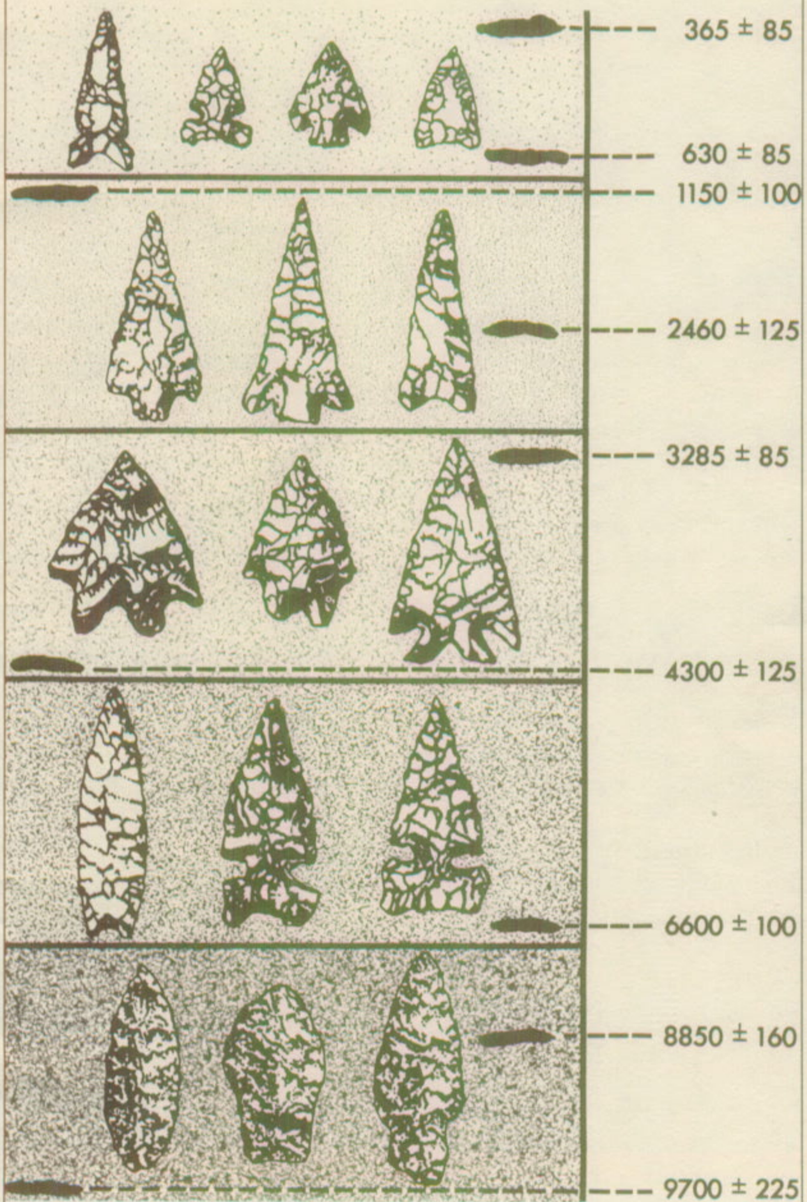

Figure 1.1 Hypothetical stratified archaeological site with projectile points and ^{14}C dated firehearths.

present in the earth's atmosphere, and is absorbed into the tissues of all living organisms as part of the life process. The ^{14}C, being inherently unstable, is subject to radioactive decay over time; release of a beta particle converts it to the stable element Nitrogen-14 (^{14}N). This decay process goes on continuously. But living organisms are always taking in fresh ^{14}C, so the amount of it they contain remains at the same level as in the atmosphere. When an organism dies, however, it ceases to take in fresh ^{14}C. After the death of an organism, therefore, the amount of ^{14}C contained in its remains decreases steadily, at a rate which is expressed as its half-life.

A half-life of 5568 years was determined for ^{14}C in the early days of radiocarbon dating, and is still used today. Simply, after 5568 years a piece of dead organic matter will contain half as much ^{14}C as it did when living; after another 5568 years, it will contain half the previous amount; and so on. The amount of ^{14}C in dead organic matter continually decreases until the quantity left is too small to be measured accurately. The practical limit of radiocarbon dating is about 40,000 years, although with special equipment, special techniques, and favorable circumstances, it is possible to push this limit to approximately 70,000 years in some cases.

Specimens of wood, bone, shell, or plant fiber—anything organic—can be dated by the ^{14}C method. The amount of ^{14}C remaining in a dating sample from an archaeological site can be measured in the laboratory, and from this quantity the age of the specimen — in radiocarbon years before present (hereafter BP) — can be calculated mathematically.

Radiocarbon dates are reported by laboratories in terms of a mean and a standard deviation. The mean is the calculated age in radiocarbon years. The standard deviation expresses the effect of normal random fluctuations in the measured radioactive decay rate. For a date reported as 5000 +/- 100 BP (that is, 5000 years before present, with a standard deviation of plus or minus 100 years), the odds are 2 to 1 that the actual age lies somewhere within 100 years on either side of 5000 BP. If the standard deviation is doubled, in this example to 200 years, the statistical odds become 19 to 1 that the true date lies within 200 years on either side of 5000 BP (that is, somewhere between 4800 and 5200 BP). Laboratory calculations are always reported with standard deviations, but in this book the deviations have been dropped for the sake of brevity.

All dates in the following text are expressed as years BP, or years ago, except in the rare cases where written historical documents are cited.

Virtually all archaeological dates are directly or indirectly determined by the radiocarbon method, so it is important to note that radiocarbon years are not precisely the same length as conventional calendar years. It is now known that the true half-life of ^{14}C is about 3% longer than the originally derived value, which is still conventionally used in calculating radiocarbon ages. Because so many dates were established before the new half-life was determined, and because the difference in ages calculated by the two measurements is not large, the original half-life remains the international standard.

A second factor affecting the length of radiocarbon years is that the amount of ^{14}C in the Earth's atmosphere rises and falls slightly over long intervals of time. Correction factors for this effect have been developed by running ^{14}C dates on growth-ring segments of known calendric age from bristlecone pine. This tree is extremely long-lived, and ages can be precisely determined by counting its annual growth rings. With the difference known between tree-ring (calendric) and radiocarbon ages for a sample, a correction factor can be calculated for that point in time. Many samples have now been dated by this dual method, and past fluctuations in the ^{14}C curve plotted. However, since the bristlecone pine record only goes back continuously for the last 7000 years, no correction factors are established beyond that range. Where longer ranges of time are involved, as in this book, the use of corrected ages before 7000 years ago and uncorrected ages after that point would create misleading chronological disparities of hundreds of years. A system that converted ages to the Christian calendar, using BC/AD dates, would add further complications. As a practical matter it is better to have a somewhat less exact, but consistent, system for reckoning time, than to have a mixed system that creates anomalies in the record. For the sake of clarity, therefore, uncorrected ^{14}C dates BP are used in the present text. For a fuller account of the radiocarbon dating method, including ramifications and complications not described here, see Taylor (1987).

Typological Cross-Dating

Typological cross-dating is another fundamental archaeological technique. It has long been used in conjunction with stratigraphic sequencing, and more recently with radiocarbon dating. Carefully shaped artifacts such as projectile points, or intricately crafted materials such as basketry, are often of highly distinctive types, made only in certain areas over certain spans of time. When distinctive or diagnostic types are found in stratigraphic sequence at an excavated site, their time of occurrence relative to one another is established; thereafter it is possible to infer, when the same diagnostic types are found elsewhere, the relative time of occupation of those sites. Where radiocarbon dates have been obtained for sites containing diagnostic types, the actual periods of time over which such types were made can be directly dated. Subsequently, when diagnostic artifacts are found on other sites, an archaeologist can approximate the time of site occupation based on artifact typology alone (Figure 1.1).

Reasoning From the Present to the Past

Interpretation of prehistoric artifacts, and definition of past societies, depends heavily upon analogies drawn from living groups. Traditional customs, languages, and technology have been recorded in recent times from the testimony of people who still lived or still remembered the old ways of life. This is the substance of ethnography, which guides the cultural interpretation of archaeological evidence. Ancient flaked stone arrow points, knives, scrapers, and drills, or more perishable objects such as antler digging stick handles, sheep horn wrenches, fish traps, and harpoons, can be identified because their counterparts were still made and used in recent times by descendants of America's original people. Of course, some objects made in the past have no obvious modern counterparts. These leave some puzzlement or ambiguity in interpretations, but in fact the probable function of most commonly recovered artifacts can be identified with a good deal of assurance.

Not only the tools but the traditional activities and movements of historic peoples are guides to understanding the past. In taking subsistence from their natural environment and pursuing their lives, hunting-gathering peoples like the original Oregonians gathered a wide variety of plant foods, medicines, and raw materials for household manufactures; hunted and fished for many kinds of animals; and gathered together for social activities, religious observances, trade, and the negotiation of marriages. The distribution over the landscape of natural resources, and the changing seasons, determined the locations and times of many human activities. Root crops bloomed in rocky uplands, fish spawned in rivers and lakes, marmots came out of hibernation among rimrocks and ledges, seeds ripened in grassy flats, deer were driven down from the mountains by snow. Ethnographic accounts show how traditional groups scheduled their activities and movements to fit environmental and ecological facts, and these accounts guide the interpretation of archaeological evidence.

Of course it is probable — indeed in matters of detail it is certain — that past ways of life were not identical to those known in historic times. But generally similar ecological factors shaped the lives of both historic and prehistoric occupants of any given landscape, and this validates the use of ethnographic analogies as a key step toward interpreting archaeological evidence. The archaeological facts, in turn, can show how past human activities may have differed from those indicated in the ethnographic models. Because of this intimate relationship between ethnography and archaeology, each of the following regional chapters begins with a sketch of the traditional lifeway as remembered and described by recent cultural descendants. Because climatic changes can alter the resource productivity of a region and thus affect human adaptations, each chapter also contains discussions of landscape and climate, and of time and environmental change.

Archaeological Places and Culture Areas

The archaeology of place — that is, of individual sites and specific places — is stressed in the following chapters. This follows directly from the culture-ecological orientation to prehistory. Each site was a place from which certain human activities were staged, and it occupied a position within some larger set of places where people carried out the many and varied activities of their lives. The sites described in this book exemplify various aspects of prehistoric cultural systems, but much research is still needed before a comprehensive account of Oregon's various regional systems, and their changes through time, can be written.

Traditional cultures were closely adapted to the landscapes in which they grew, and there was a strong congruence between culture and environment (Kroeber 1939). In western North America, the largest cultural and natural areas were the Northwest Coast, running from the Gulf of Alaska to about Cape Mendocino in northern California; the Plateau, extending from the Cascades to the Rockies, and north from the Columbia River drainage to well beyond the international border with Canada; the Great Basin, stretching from east-central Oregon southward to the Colorado River; and California, defined approximately by the state's modern political borders west of the Sierra-Cascades (Figure 1.2).

All of the named cultural and natural areas touch within Oregon's present boundaries. Northern Great Basin and Plateau cultures are well-attested east of the Cascades. Northwest Coast culture reached its highest elaboration far to the north, in British Columbia and Alaska, but native peoples of the Columbia River estuary and Oregon Coast pursued a very similar way of life. Oregon's Willamette Valley, a distinctive oak-grassland savanna, was geographically and culturally intermediate

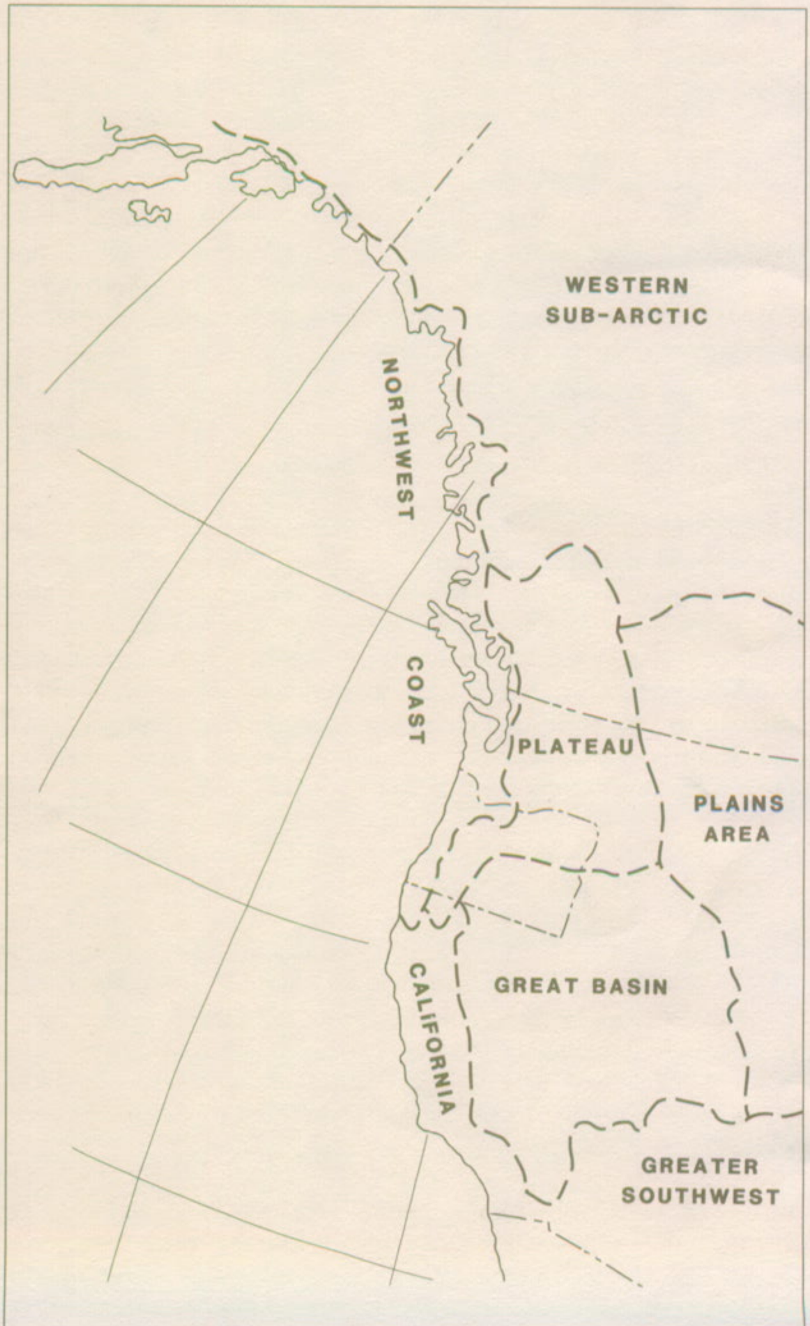

Fig. 1.2. Culture areas of western North America.

between the Plateau and California. The California area extended into Oregon's Southwestern Mountains. Because of these geographical circumstances, an account of Oregon's prehistory can serve to introduce the general features of traditional native culture over much of the far west.

Language Diversity, Cultural Tradition, and Prehistory

A map of Oregon groups as they were distributed in 1850 shows great cultural diversity (Figure 1.3). Thirteen different families of languages are represented, the highest degree of linguistic diversity being west of the Cascades. Nine of these families belong to the great Penutian phylum of languages, which has representatives in Oregon, Washington, and California, and possible connections as distant as Mexico and Central America. Penutian languages dominate the western and northern parts of the state. The Northern Paiute language of east-central and southern Oregon represents the Aztec-Tanoan phylum. Aztec-Tanoan languages have an extremely broad distribution in the far west, extending from eastern Oregon to central Mexico. Much of Oregon's northwestern coast was occupied by speakers of Salishan languages, a family widespread farther north in Washington and British Columbia. Languages of the Athabaskan family were spoken in a small area of extreme northwestern Oregon, and a larger area in southwestern Oregon, extending inland from the coast along the Rogue River. The main body of Athabaskan-speaking peoples lives far to the north, in western Canada and Alaska. Finally, the Shasta, a mostly Californian people whose range extended a short distance into southwestern Oregon, used a speech belonging to the Hokan linguistic phylum. Hokan languages are spoken widely in California and Mexico, and as far south as Central America.

These distributions place the native languages of Oregon in continental perspective. They demonstrate forcefully the ethnic diversity of western North America in general, and Oregon in particular. The fact that related languages were spread over so vast an area indicates a long and complex history of migrations and dispersals, in which aboriginal Oregonians participated. The temporal scale implied is as vast as the spatial one, with a time depth spanning the period of human occupation.

The linguistic map also has more specific implications for Oregon prehistory. Long ago, people speaking an ancestral Penutian language spread widely in the Oregon country. Through normal linguistic change, this original speech community gradually split up into local sister languages. Some of these sister languages later split again, creating further linguistic diversity. By the early 19th century, many related Penutian languages had been formed through this process. The Kalapuyan family of the Willamette Valley, for example, made up a continuous chain of small, closely related languages in a pattern suggesting that Kalapuyan subgroups gradually drifted apart in their speech over some thousands of years of stable co-residence in the area. It is clear from such linguistic evidence that Penutian languages have been spoken in Oregon for a very long time.

The Northern Paiute language of eastern Oregon, by contrast, is spread over a vast area but shows very little internal variation. It is in fact a single speech, intelligible to people across hundreds of miles. This homogeneity implies that Northern Paiute speakers have not been in Oregon for nearly as long as the Penutian speakers — though it also must reflect to some degree the highly nomadic lifeway of the Paiutes, whose continual movement and social interaction over long distances would have retarded the process of linguistic divergence. Evidence from elsewhere in the far west also supports the idea that the Northern Paiutes expanded their range into Oregon's Northern Great Basin in quite recent times, perhaps within the last few hundred years.

The Salishan and Athabaskan-speakers of western Oregon represent offshoots of more northerly groups, whose homelands were in western Washington and Canada. Like the Paiute-speakers, they probably took up residence in Oregon long after the Penutian-speakers were established here. Finally, the Shasta of extreme southwest Oregon speak a Hokan language. Hokan languages in general differ greatly from one another, implying that they split apart a very long time ago. The scattered distribution of Hokan speech communities down the western side of the continent, deep into Central America, reinforces this conclusion. These indicators of antiquity make it likely that Hokan-speaking people were already present in the Oregon-California area before the arrival of the Penutian-speakers, stemming from a time when Hokans possibly occupied much of western North America.

Comparing the linguistic (Figure 1.3) and topographic maps (Figure 1.4) of Oregon shows a striking correspondence between major language groups and major environmental zones. The Northern Paiute range fits closely the Great Basin desert territory of southeastern Oregon, though these people were pushing into the drier edges of Penutian lands by the 19th century. Penutian-speaking groups, by contrast, consistently occupied the better watered country to the north and west. It is notable that Salishan and Athabaskan-speaking immigrants, whose homelands were in well-watered country to the north, moved into the moister Penutian territory rather than into the deserts. These correlations seem to reflect the fact that over generations people learn the plant, animal, and other resources of the natural environment which they occupy, and adapt their tools and behavior—their culture— to that environment. Ultimately, groups tend to become bound to a particular environmental setting, which their traditional body of knowledge, learned and passed down over centuries, has equipped them to inhabit better than any other. Of course individual people move across natural boundaries, learning different ways of life and different languages, but it is rare that entire groups do so (see Jorgensen [1980: 51-83] for an excellent, extended discussion of language, culture, and environment in western North America).

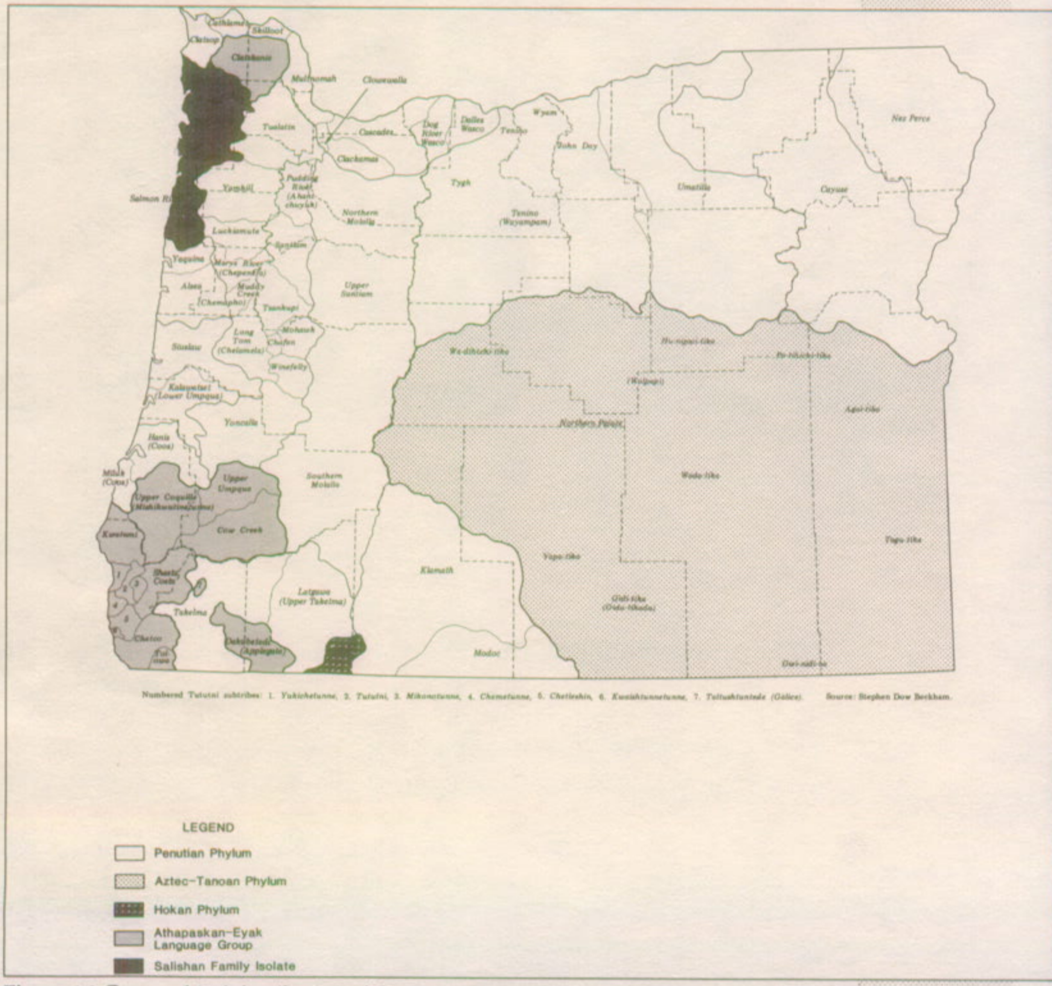

Figure 1.3 Geographical distribution of Oregon native groups in 1850.

Figure 1.4. Topographic map of Oregon.

Prospect

The subject of this book is the technological, societal, and ecological traditions that the original people of Oregon developed in adapting to their land over the immense span of time they have occupied it. Evidence of those traditions is gathered by archaeologists, who study the prehistoric sites that are the irreplaceable record of the Native American past. The work of natural scientists, especially those who study ancient environments and the changes they have undergone, is also essential to the story. Interpretation of the archaeological and environmental evidence is crucially informed by the cultural knowledge of historic and contemporary native Oregonians, who have been describing and explaining traditional ways of life to chroniclers, cultural anthropologists, and linguists for nearly two centuries (see Buan and Lewis, 1991).